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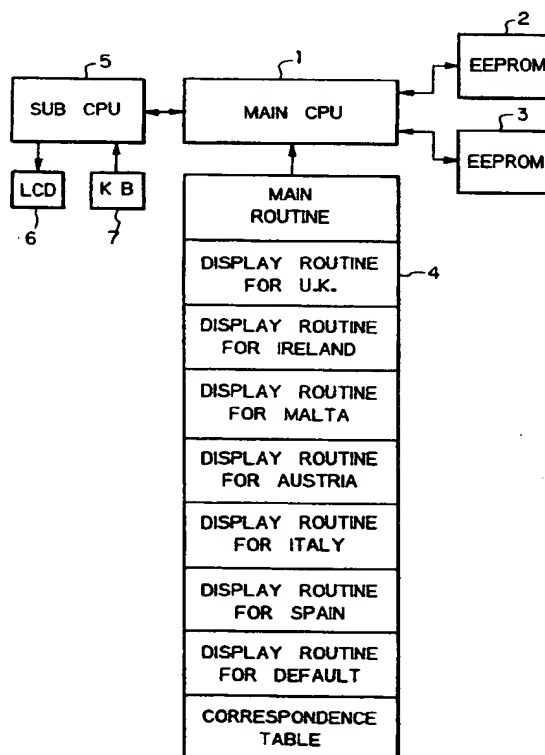
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(54) Telephone apparatus with automatic dialling and a display mode function.

(57) In a mobile telephone apparatus, a currently-used telephone number is stored in an EEPROM (3), and a display mode corresponding to a part of the currently-used telephone number is displayed in a display unit (6).

Fig. 1



EP 0 552 733 A2

The present invention relates to a mobile telephone apparatus such as an automobile telephone apparatus or a portable telephone apparatus, and more particularly, to the improvement of a display system of the mobile telephone apparatus.

Generally, the hardware of a mobile telephone apparatus may be used commonly in various geographical areas or countries such as the United Kingdom, Ireland, Malta, Austria, Italy and Spain.

In a prior art mobile telephone apparatus, a single program is incorporated for displaying messages in a display unit, and as a result, the language and contents of the displayed messages are fixed for a specific area (country). Therefore, if this prior art mobile telephone apparatus is to be used in another country, it is necessary to exchange the program with another program, i.e., to exchange a read-only memory (ROM) with another one even when the telephone apparatus incorporates a plurality of telephone numbers for a plurality of countries.

Also, in another prior art mobile telephone apparatus which incorporates a plurality of programs to provide a plurality of display modes for a plurality of countries, it is necessary to select one of the display modes in advance.

It is an object of the present invention to provide a method and mobile telephone apparatus for automatically displaying messages whose language and contents are determined in accordance with a geographical area or country in which the mobile telephone apparatus is currently being used.

According to the present invention, in a mobile telephone apparatus, a currently-used telephone number is stored, and a display mode corresponding to a part of the currently-used telephone number is displayed.

The present invention will be more clearly understood from the description as set forth below with reference to the accompanying drawings, wherein:

Fig. 1 is a block circuit diagram illustrating an embodiment of the mobile telephone apparatus according to the present invention;

Fig. 2 is a diagram showing an example of the correspondence table of Fig. 1;

Figs. 3A, 3B and 3C are flowcharts showing the operation of the main CPU of Fig. 1; and

Figs. 4A, 4B, 4C and 4D are diagrams showing display examples of the display unit of Fig. 1.

In Fig. 1, which illustrates an embodiment of the present invention, reference numeral 1 designates a main central processing unit (CPU) for accessing nonvolatile memories such as EEPROM's 2 and 3 for storing telephone numbers and a ROM 4 for storing programs and fixed data. The EEPROM 2 stores one or more telephone numbers specialized for one or more countries, and the

EEPROM 3 stores a currently-used telephone number selected from the EEPROM 2. The content of the EEPROM 2 is preset by telephone service operator companies or the like, and the content of the EEPROM 3 is set by a user of the mobile telephone apparatus.

Stored in the ROM 4 are a main routine (program), a display routine for the United Kingdom, a display routine for Ireland, a display routine for Malta, a display routine for Austria, a display routine for Italy, a display routine for Spain, a display routine for a default mode, and a correspondence table between the six geographical areas (countries) and the three most significant digits (MSD's) of telephone numbers. Note that, generally in Europe, a telephone number for a mobile telephone number is formed by ten digits whose three MSD's correspond to codes in conformity with the International Telegraph and Telephone Consultative Committee (CCITT), as shown in Fig. 2. Note also that the content of the EEPROM 2 is preset by telephone service operator companies or the like simultaneously with the presetting of the EEPROM 2.

Also, in Fig. 1, reference numeral 5 designates a sub CPU for accessing a display unit such as a liquid crystal device (LCD) 6 and a keyboard 7.

In the mobile telephone apparatus of Fig. 1, an area name (country name) is identified from the currently-used telephone number stored in the EEPROM 3 using the correspondence table stored in the ROM 4, to thereby automatically switch the display mode to the identified area (country).

The operation of the main CPU 1 will now be explained with reference to Figs. 3A, 3B and 3C which show the main routine stored in the ROM 4.

When the mobile telephone apparatus is powered ON, the routine of Figs. 3A, 3B and 3C is started by step 301 of Fig. 3A. Then, at step 302, the main CPU 1 reads a currently-used telephone number out of the EEPROM 3, and at step 303, it is determined whether or not the three MSD's of the telephone number are "234" (United Kingdom code). As a result, if the three MSD's are "234", the control proceeds to step 304 which causes a display mode number M to be "1". Otherwise, the control proceeds to step 305. At step 305, it is determined whether or not the three MSD's of the telephone number are "272" (Ireland code). As a result, if the three MSD's are "272", the control proceeds to step 306 which causes the display mode number M to be "2". Otherwise, the control proceeds to step 307. At step 307, it is determined whether or not the three MSD's of the telephone number are "278" (Malta code). As a result, if the three MSD's are "278", the control proceeds to step 308 which causes the display mode number M to be "3". Otherwise, the control proceeds to

step 309. At step 309, it is determined whether or not the three MSD' s of the telephone number are "232" (Austria code). As a result, if the three MSD' s are "232", the control proceeds to step 310 which causes the display mode number M to be "4". Otherwise, the control proceeds to step 311. At step 311, it is determined whether or not the three MSD' s of the telephone number are "222" (Italy code). As a result, if the three MSD' s are "222", the control proceeds to step 312 which causes the display mode number M to be "5". Otherwise, the control proceeds to step 313. At step 313, it is determined whether or not the three MSD' s of the telephone number are "214" (Spain code). As a result, if the three MSD' s are "214", the control proceeds to step 314 which causes the display mode number M to be "6". Otherwise, the control proceeds to step 315 which causes the display mode number M to be "0" for a default mode.

The control at step 304, 306, 308, 310, 312, 314 or 315 proceeds to step 316 of Fig. 3B. At step 316, it is determined whether or not the display mode number M is "1". As a result, if M equals "1", the control proceeds to step 317 which initiates the United Kingdom display routine. In the United Kingdom display routine, for example, the main CPU 1 transmits a serial display data "VODAFONE" or "Cellnet" to the sub CPU 5, thereby displaying the data "VODAFONE" or "Cellnet" as shown in Fig. 4A or 4B. Note that "VODAFONE" and "Cellnet" are names of United Kingdom service operator companies. Otherwise, the control proceeds to step 318. At step 318, it is determined whether or not the display mode number M is "2". As a result, if M equals "2", the control proceeds to step 319 which initiates the Ireland display routine. In the Ireland display routine, the main CPU 1 transmits a serial display data of an Irish service operator company. Otherwise, the control proceeds to step 320. At step 320, it is determined whether or not the display mode number M is "3". As a result, if M equals "3", the control proceeds to step 321 which initiates the Malta display routine. In the Malta display routine, the main CPU 1 transmits a serial display data of a Malta service operator company. Otherwise, the control proceeds to step 322. At step 322, it is determined whether or not the display mode number M is "4". As a result, if M equals "4", the control proceeds to step 323 which initiates the Austrian display routine. In the Austrian display routine, the main CPU 1 transmits a serial display data of an Austrian service operator company. Otherwise, the control proceeds to step 324. At step 324, it is determined whether or not the display mode number M is "5". As a result, if M equals "5", the control proceeds to step 325 which ini-

tiates the Italian display routine. In the Italian display routine, the main CPU 1 transmits a serial display data of an Italian service operator company. Otherwise, the control proceeds to step 326. At step 326, it is determined whether or not the display mode number M is "6". As a result, if M equals "6", the control proceeds to step 327 which initiates the Spanish display routine. In the Spanish display routine, the main CPU 1 transmits a serial display data of a Spanish service operator company. Otherwise, since the currently-used telephone number is not located in the correspondence table, the control proceeds to step 328 which initiates the default display routine. In the default display routine, for example, the main CPU 1 transmits a serial display data "Service-A" or "Service-B" to the sub CPU 5, thereby displaying the data "Service-A" or "Service-B" as shown in Fig. 4C or 4D.

The control at step 317, 319, 321, 323, 325, 327 or 328 proceeds to step 329 of Fig. 3C.

At step 329, the main CPU 1 determines whether or not key input data from the keyboard 7 requesting a change of the currently-used telephone number is received by the sub CPU 5. As a result, if such key input data is received by the sub CPU 5, the control proceeds to step 330 which renews the currently-used telephone number in the EEPROM 3. In other words, the main CPU 1 selects another of the preset telephone numbers in the EEPROM 2 and writes it into the EEPROM 3. Then, the control is returned to step 302 of Fig. 3A.

The above-described process is repeated by step 331 until a request for a power-OFF of the mobile telephone apparatus occurs. That is, when such a request occurs, the control proceeds to step 332 which turns OFF the power to the mobile telephone apparatus. Then, this main routine is completed by step 333.

In the above-described embodiment, although a mobile telephone apparatus used in Europe is exemplified, it is clear that the present invention can be applied to other areas or countries. Also, a larger number of kinds of display routines (programs) can be stored in the ROM 4.

As explained hereinbefore, according to the present invention, a geographical area (or country) is identified in accordance with a currently-used telephone number, to automatically switch the display mode, thereby displaying the current area or country based on the currently-used telephone number.

Claims

1. A displaying method for a mobile telephone apparatus, comprising the steps of:
storing a currently-used telephone number;

and

displaying data in accordance with a part of the currently-used telephone number.

2. A method as set forth in claim 1, further comprising the steps of:
 - storing a plurality of telephone numbers; and
 - selecting one of the plurality of telephone numbers,
 said currently-used telephone number storing step storing the selected telephone number as the currently-used telephone number.
3. A method as set forth in claim 1 or 2, further comprising the steps of:
 - storing a plurality of display modes; and
 - selecting one of the plurality of display modes in accordance with the part of the currently-used telephone number,
 said data displaying step displaying the data in accordance with the selected display mode.
4. A method as set forth in claim 1 or 2, further comprising the steps of:
 - storing a plurality of display modes each corresponding to one of a plurality of predetermined geographical areas; and
 - determining what predetermined geographical area said telephone apparatus is located in in accordance with the part of the currently-used telephone number,
 said data displaying step displaying one of the display modes corresponding to the determined geographical area.
5. A method as set forth in claim 4, wherein, when said geographical area determining step determines that said telephone apparatus is not located in any of said predetermined geographical areas, said data displaying step displays a default mode.
6. A mobile telephone apparatus comprising:
 - a first nonvolatile memory (3) for storing a currently-used telephone number; and
 - a display unit (6) for displaying data in accordance with a part of the currently-used telephone number.
7. A mobile telephone apparatus as set forth in claim 6, further comprising:
 - a second nonvolatile memory (2) for storing a plurality of telephone numbers; and
 - means (1, 4) for selecting one of the plurality of telephone numbers,
 said first nonvolatile memory (3) storing

the selected telephone number as the currently-used telephone number.

8. A mobile telephone apparatus as set forth in claim 6 or 7, further comprising:
 - a read-only memory (4) for storing a plurality of display modes; and
 - means (1, 4) for selecting one of the plurality of display modes in accordance with the part of the currently-used telephone number,
 said display unit displaying the data in accordance with the selected display mode.
9. A mobile telephone apparatus as set forth in claim 6 or 7, further comprising:
 - a read-only memory (4) for storing a plurality of display modes each corresponding to one of a plurality of predetermined geographical areas; and
 - means (1, 4) for determining what predetermined geographical area said telephone apparatus is located in in accordance with the part of the currently-used telephone number,
 said display unit displaying one of the display modes corresponding to the determined geographical area.
10. A mobile telephone apparatus as set forth in claim 9, wherein, when said geographical area determining means determines that said telephone apparatus is not located in any of said predetermined geographical areas, said display unit displays a default mode.

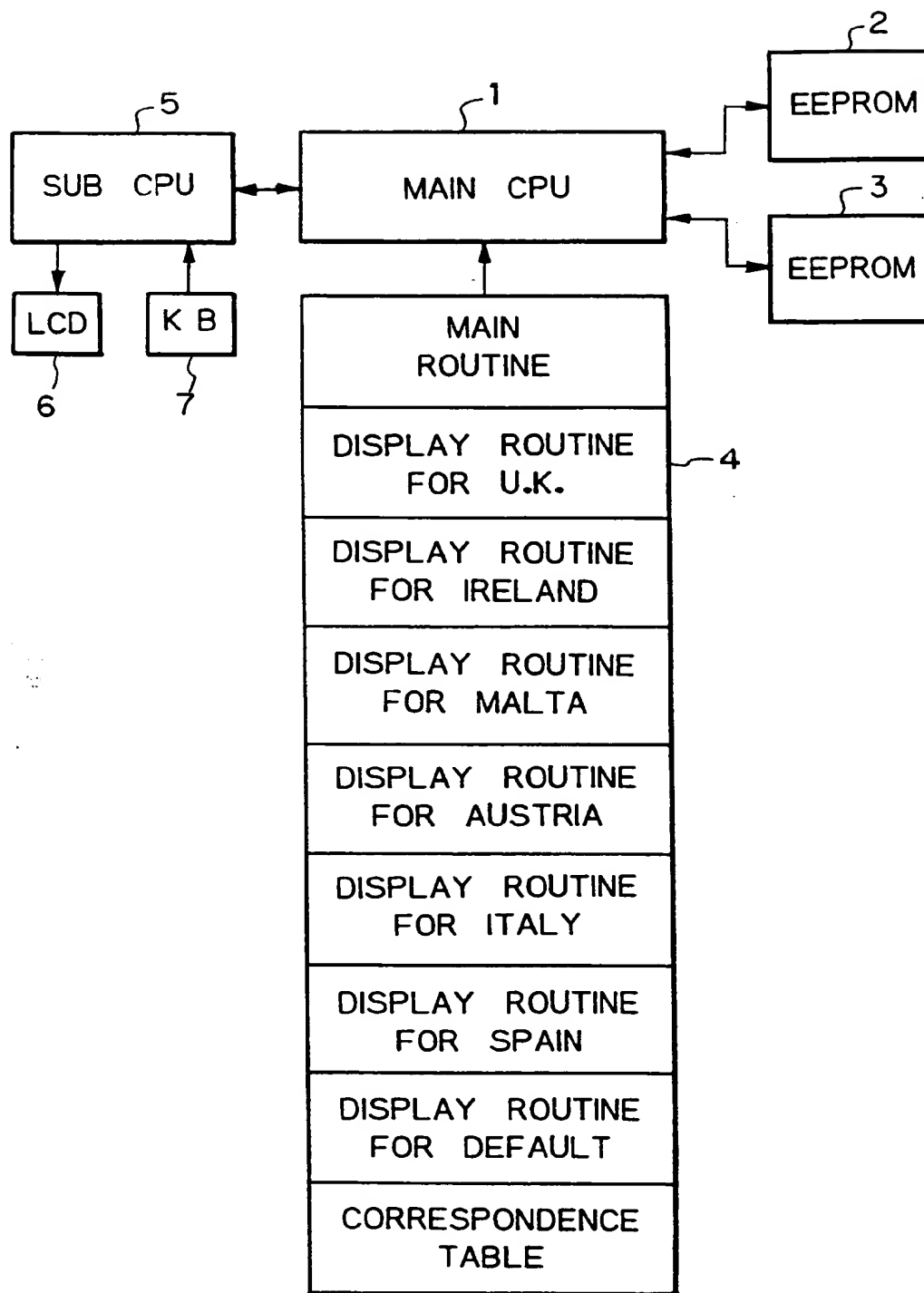
Fig. 1

Fig. 2

CODE	GEOGRAPHICAL AREA
234	U. K.
272	IRELAND
278	MALTA
232	AUSTRIA
222	ITARY
214	SPAIN

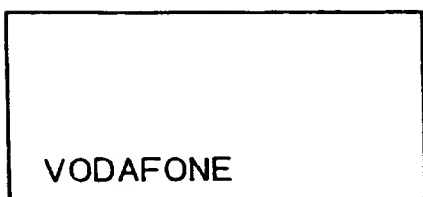
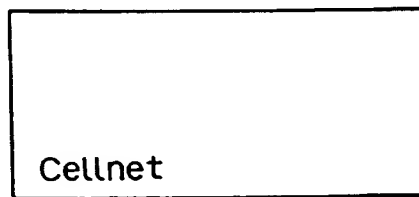
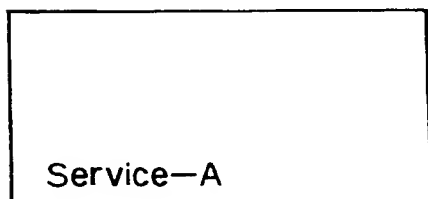
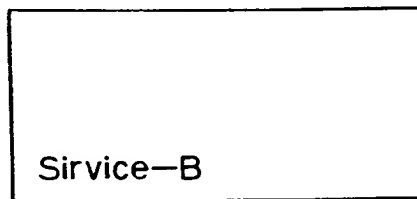
Fig. 4A*Fig. 4B**Fig. 4C**Fig. 4D*

Fig. 3A

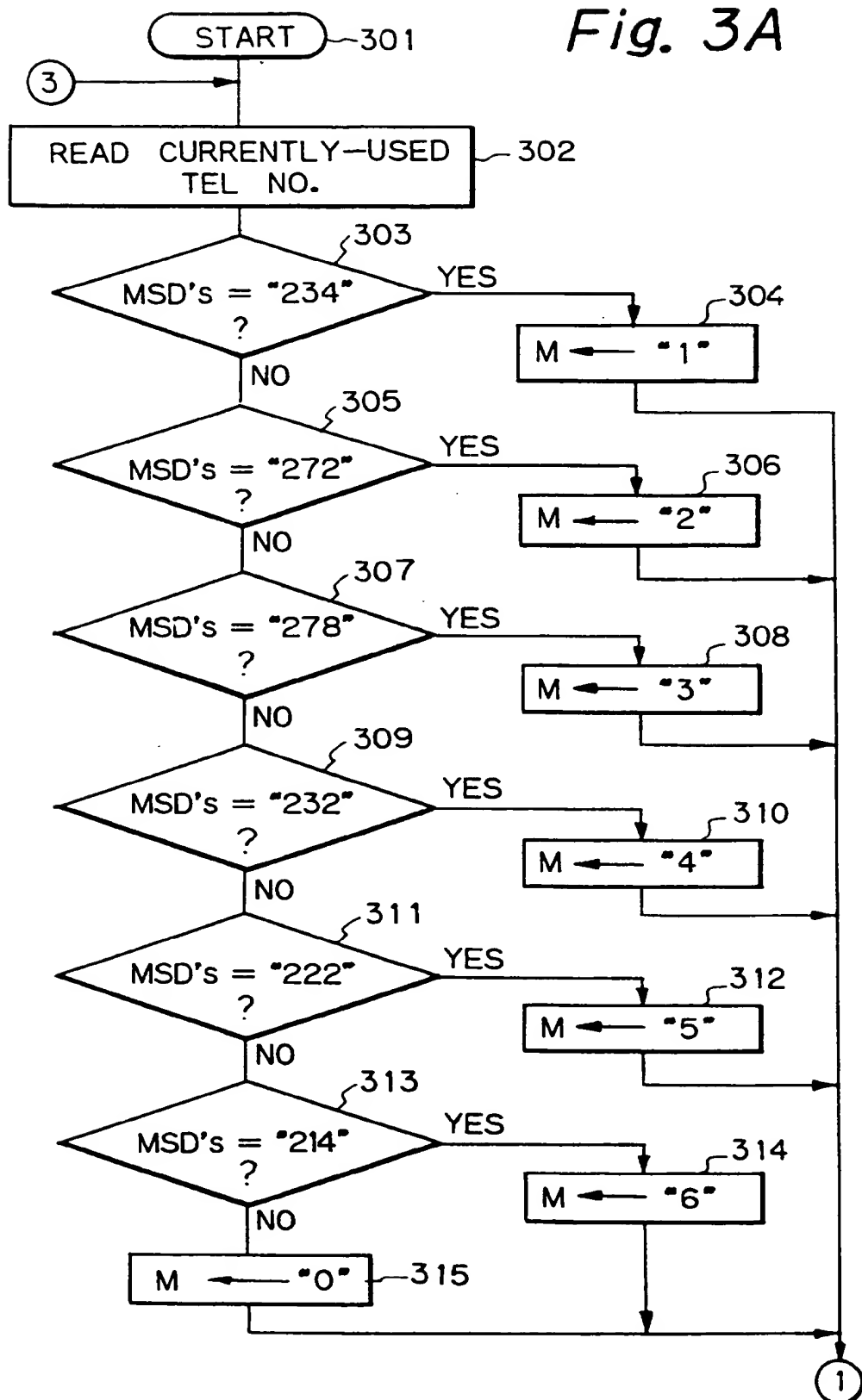


Fig. 3B

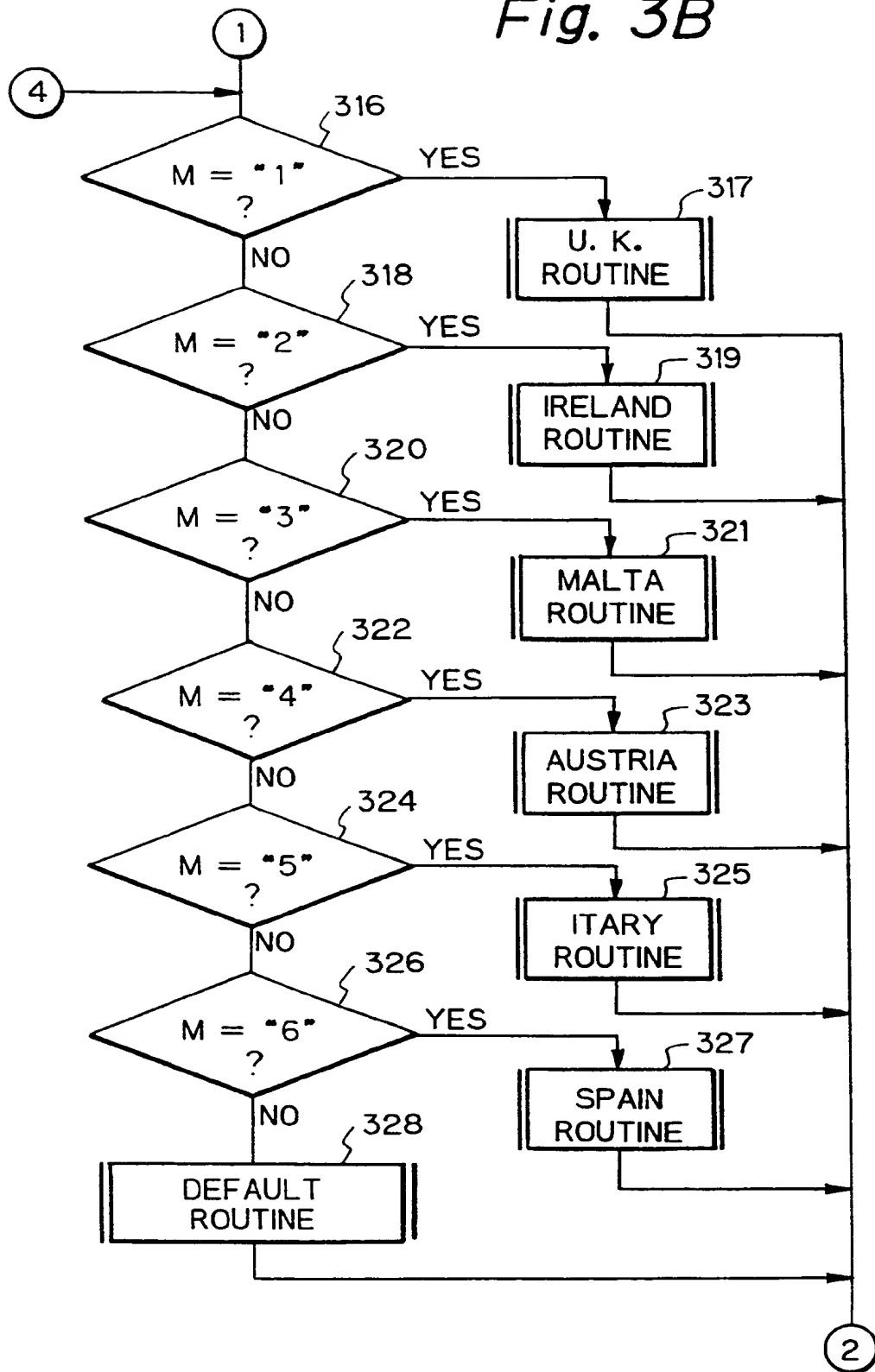
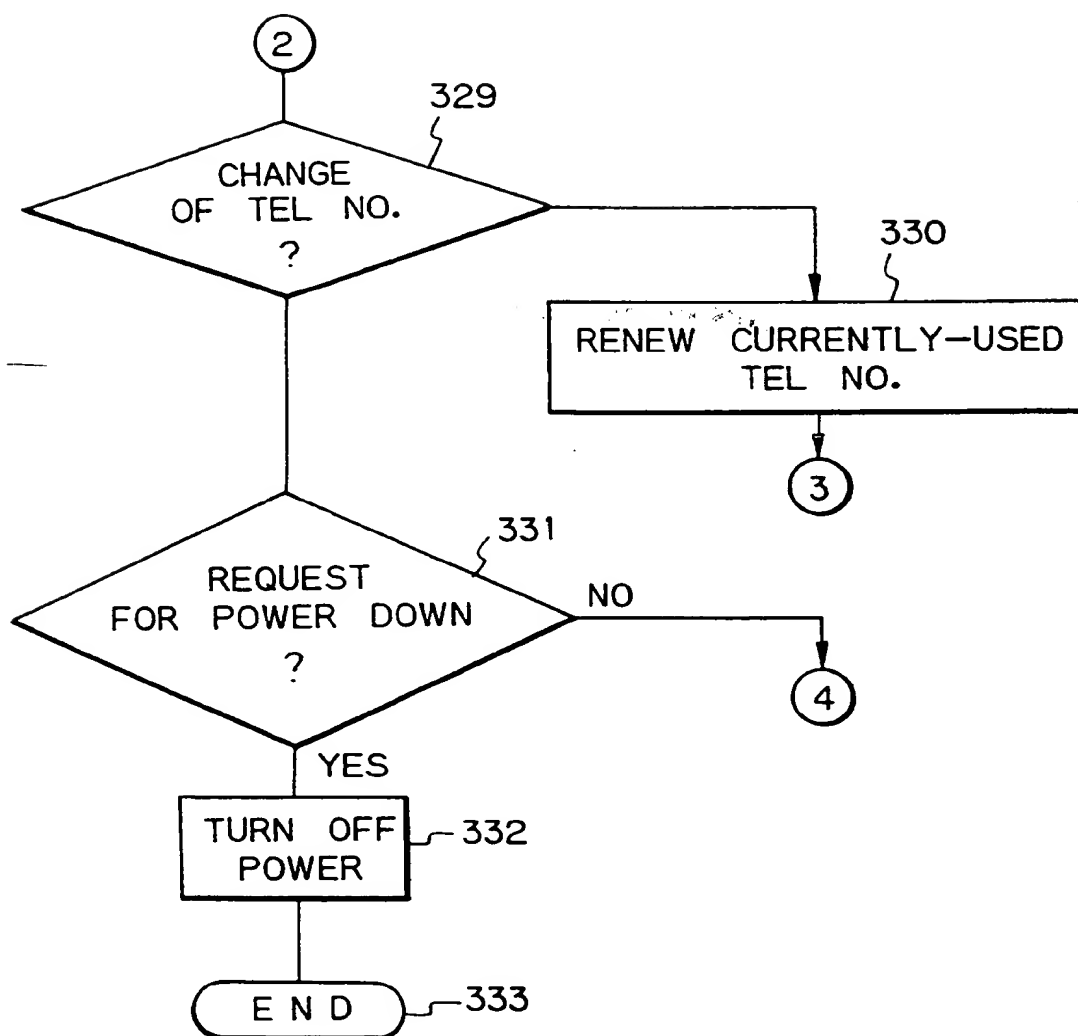


Fig. 3C



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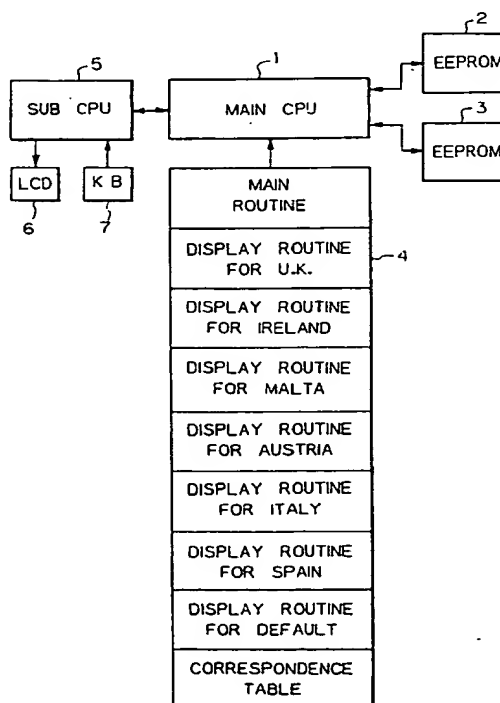
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(54) **Telephone apparatus with automatic dialling and a display mode function.**

(57) In a mobile telephone apparatus, a currently-used telephone number is stored in an EEPROM (3), and a display mode corresponding to a part of the currently-used telephone number is displayed in a display unit (6).

Fig. 1**EP 0 552 733 A3**



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EUROPEAN SEARCH REPORT

Application Number

EP 93 10 0797
Page 1

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
X	WO-A-9 114 331 (ADVANCED CELLULAR TELCOM INC.)	1,2	H04M1/274
Y	* page 10, line 10 - page 17, line 24; figures 1,2 * * page 29, line 15 - page 32, line 14; figures 2-4 *	6,7	
Y	---		
Y	WO-A-9 112 698 (MOTOROLA INC.)	6,7	
A	* page 6, line 5 - page 8, line 14; figures 2-5 * * page 11, line 12 - page 12, line 13 *	3,4,8,9	
X	---		
X	US-A-4 726 059 (HAVEL)	1	
A	* column 9, line 40 - column 16, line 21; figures 19-42 *	3,4,8,9	
Y	---		
Y	PATENT ABSTRACTS OF JAPAN vol. 16, no. 11 (E-1153)13 January 1992 & JP-A-32 31 524 (SANYO ELECTRIC) * abstract *	1,6	
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Y	PATENT ABSTRACTS OF JAPAN vol. 15, no. 465 (E-1138)26 November 1991 & JP-A-32 01 834 (NEC CORP.) * abstract *	1,6	TECHNICAL FIELDS SEARCHED (Int. Cl.5)
A	---		H04M
A	US-A-4 481 382 (VILLA REAL) * column 3, line 10 - column 4, line 44; figures 1-8 * * column 8, line 22 - column 9, line 11 * * column 10, line 54 - column 11, line 9 *	1,2,6,7	
A	---		
A	US-A-5 021 889 (YAMAMOTO) * column 2, line 10 - column 3, line 48; figures 1-4 *	3,4,8,9	

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The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 17 SEPTEMBER 1993	Examiner DELANGUE P.C.J.
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ----- & : member of the same patent family, corresponding document	
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EUROPEAN SEARCH REPORT

Application Number

EP 93 10 0797

Page 2

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A	PATENT ABSTRACTS OF JAPAN vol. 12, no. 85 (E-591)17 March 1988 & JP-A-62 219 868 (FUJITSU) * abstract * -----	3,4,8,9	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 17 SEPTEMBER 1993	Examiner DELANGUE P.C.J.
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ----- & : member of the same patent family, corresponding document			

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